OIPE JC13
JUL 14 2004
PATENT & TRADEMARK OFFICE

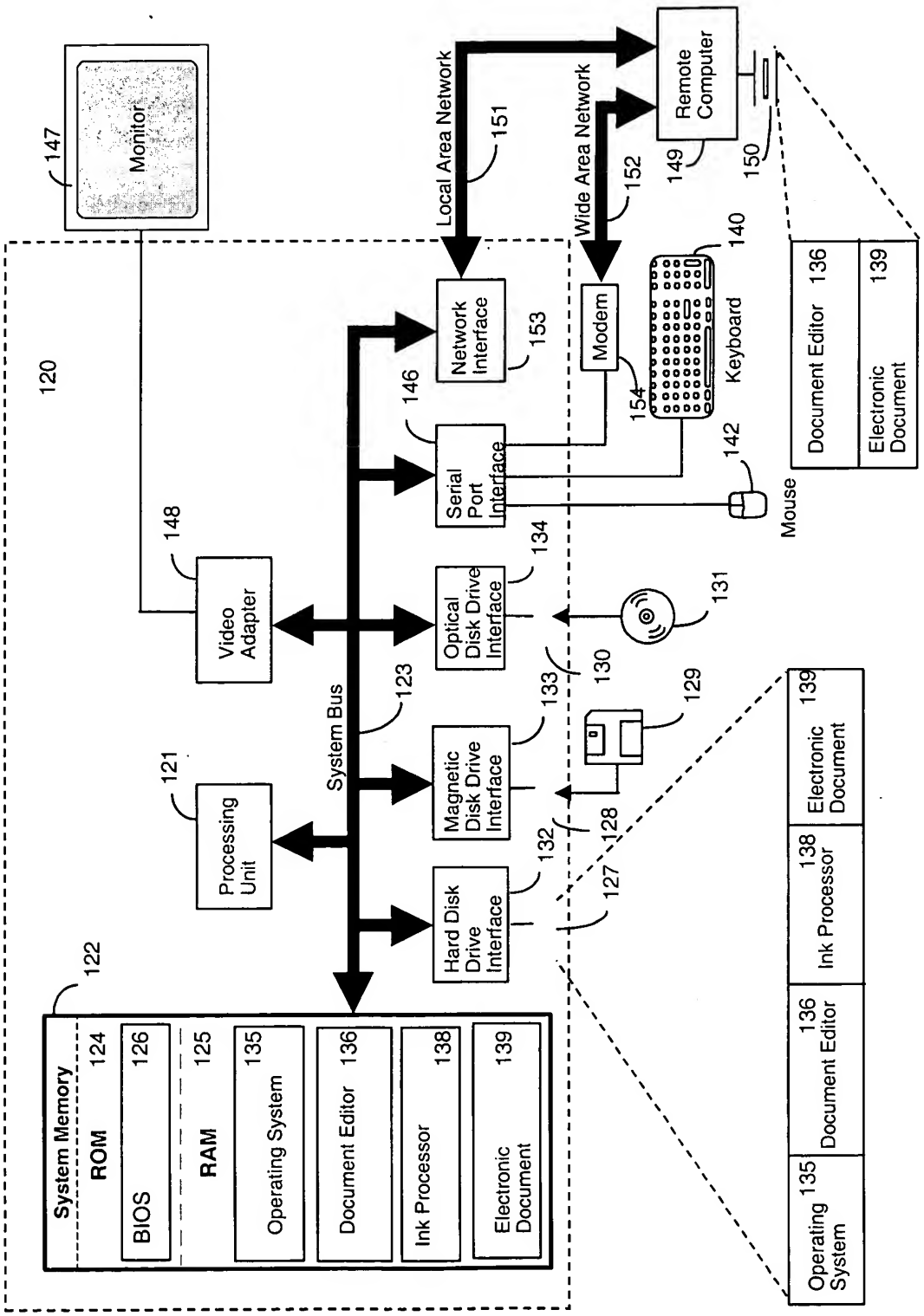

Figure 1

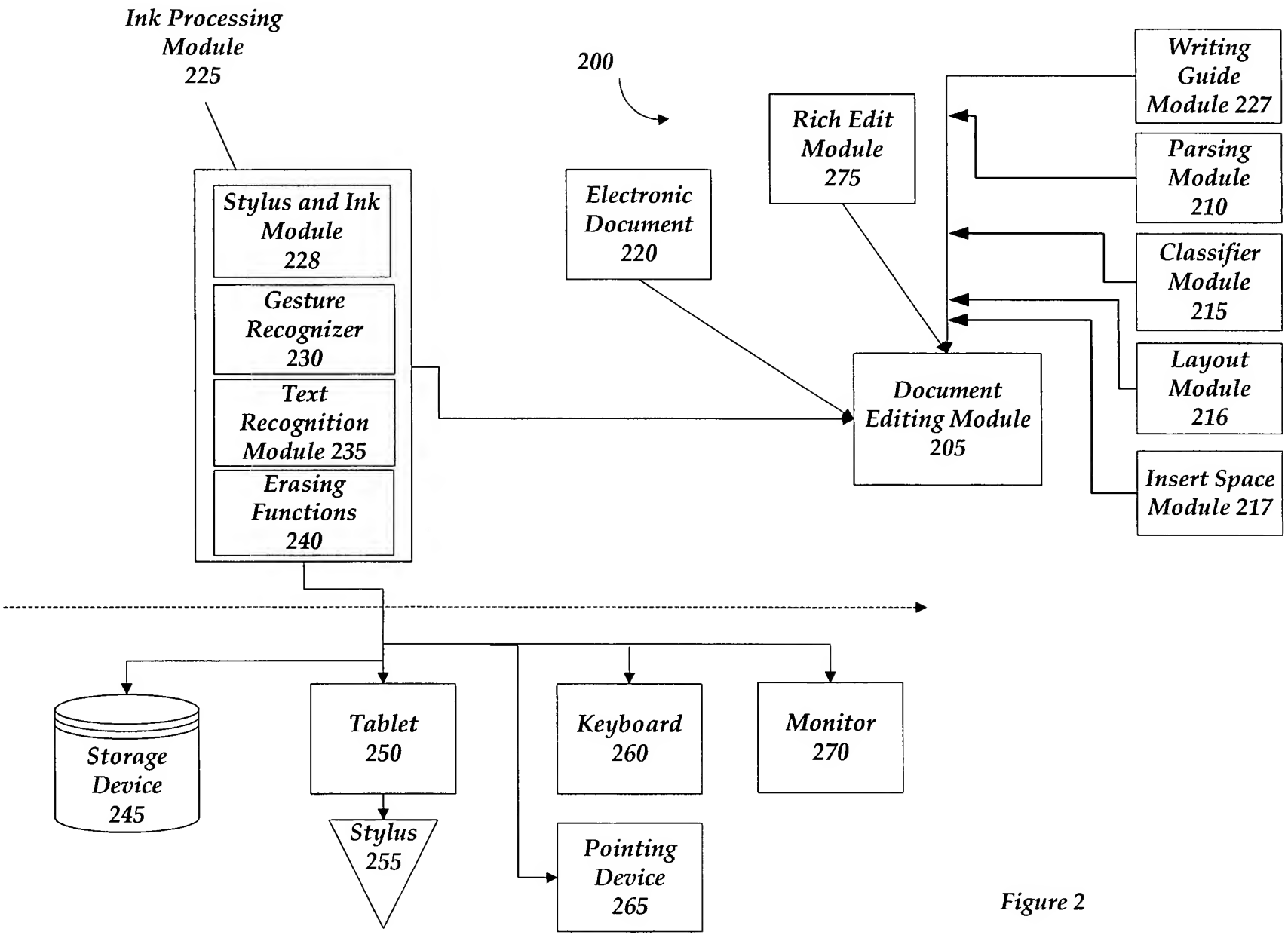

Figure 2

Inventor: Alex Simmons
Docket No.: 60001.0311US1/MS302493.1
Title: Writing Guide for a Free-Form Document Editor
Serial No.: 10/780,366
Sheet 2 of 29

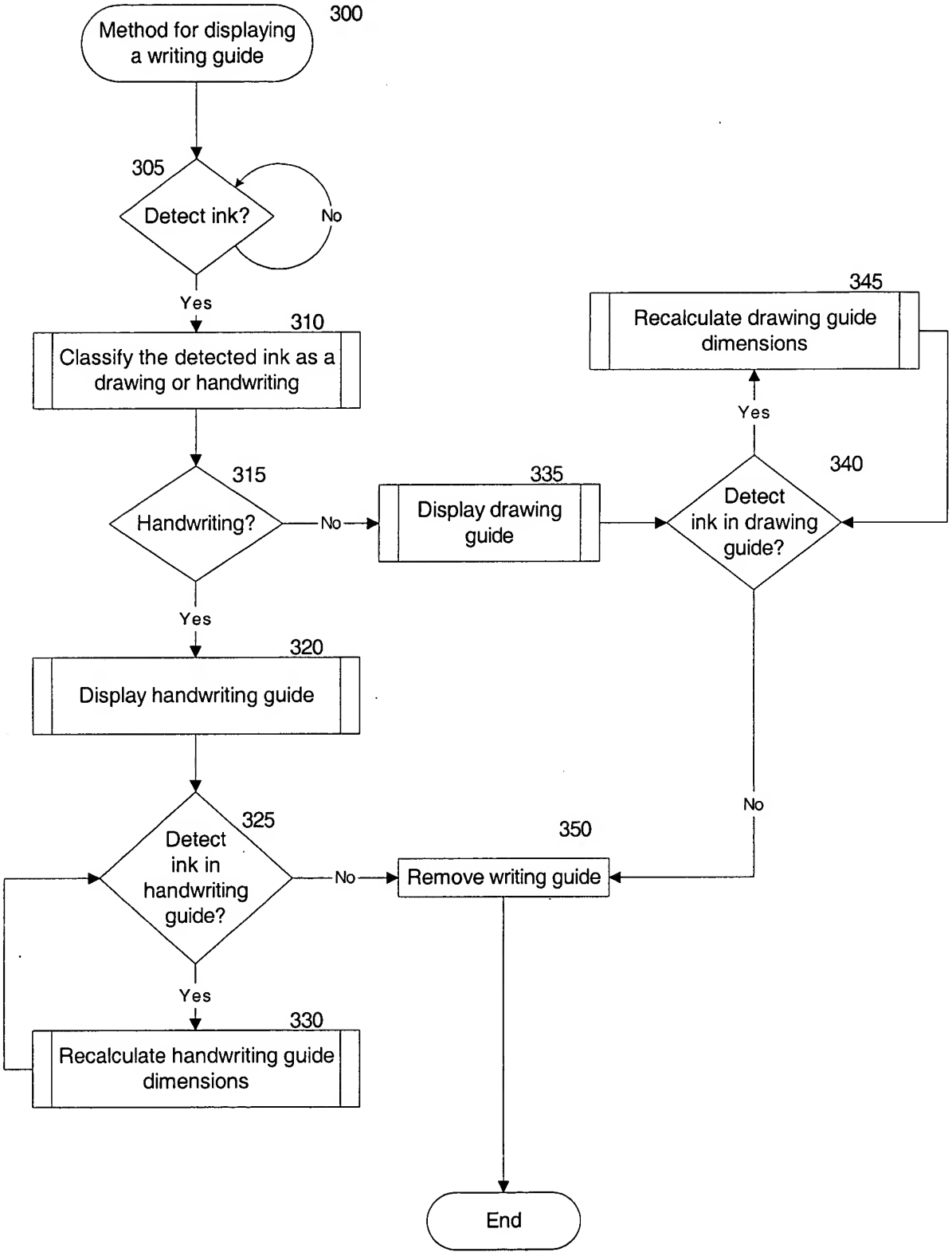
Method for displaying a writing guide
300
305
Detect ink?
No
Yes
310
Classify the detected ink as a drawing or handwriting
315
Handwriting?
No
Yes
320
Display handwriting guide
325
Detect ink in handwriting guide?
No
Yes
330
Recalculate handwriting guide dimensions
335
Display drawing guide
340
Detect ink in drawing guide?
Yes
345
Recalculate drawing guide dimensions
No
350
Remove writing guide
End

Figure 3

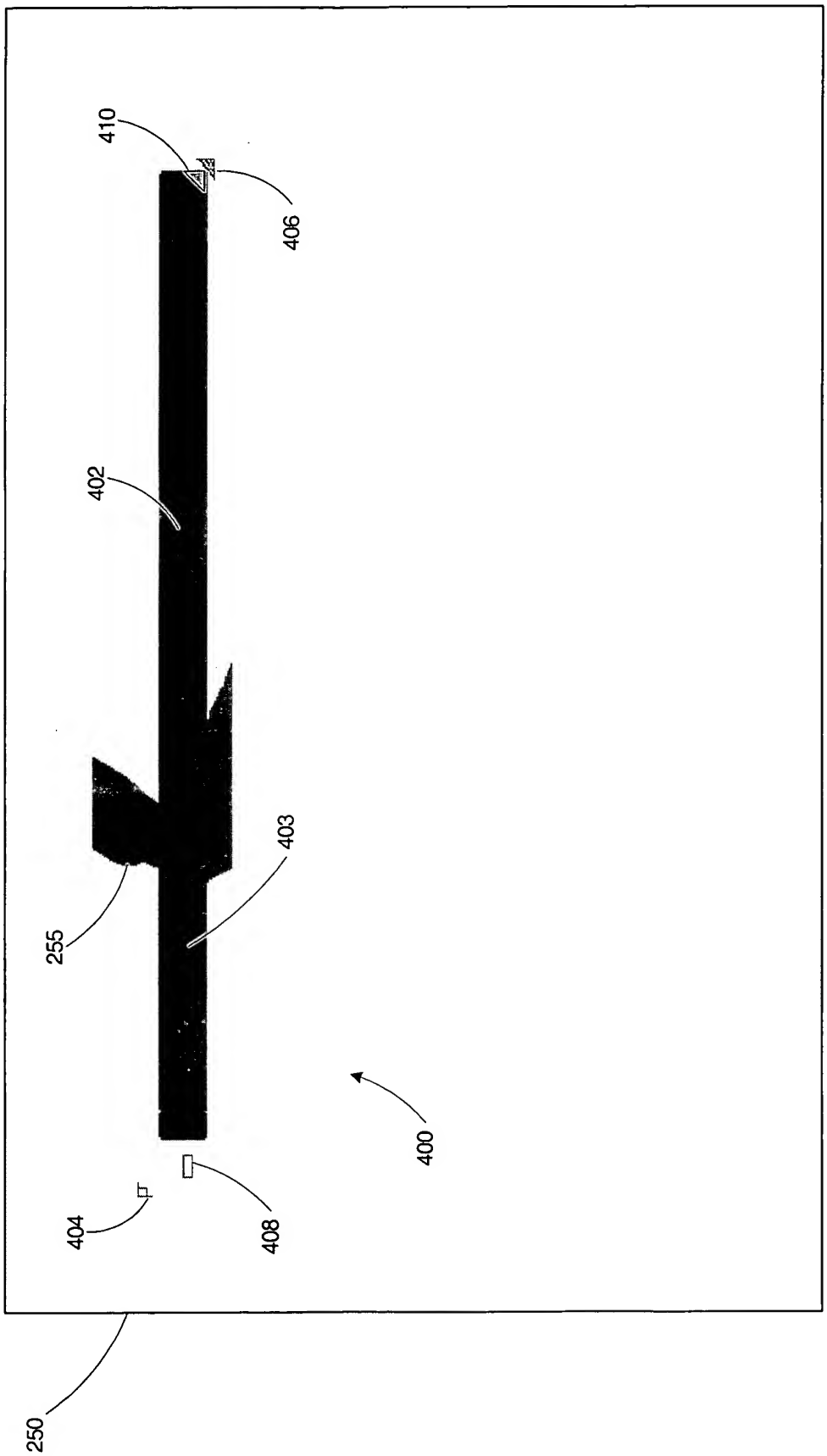

Figure 4

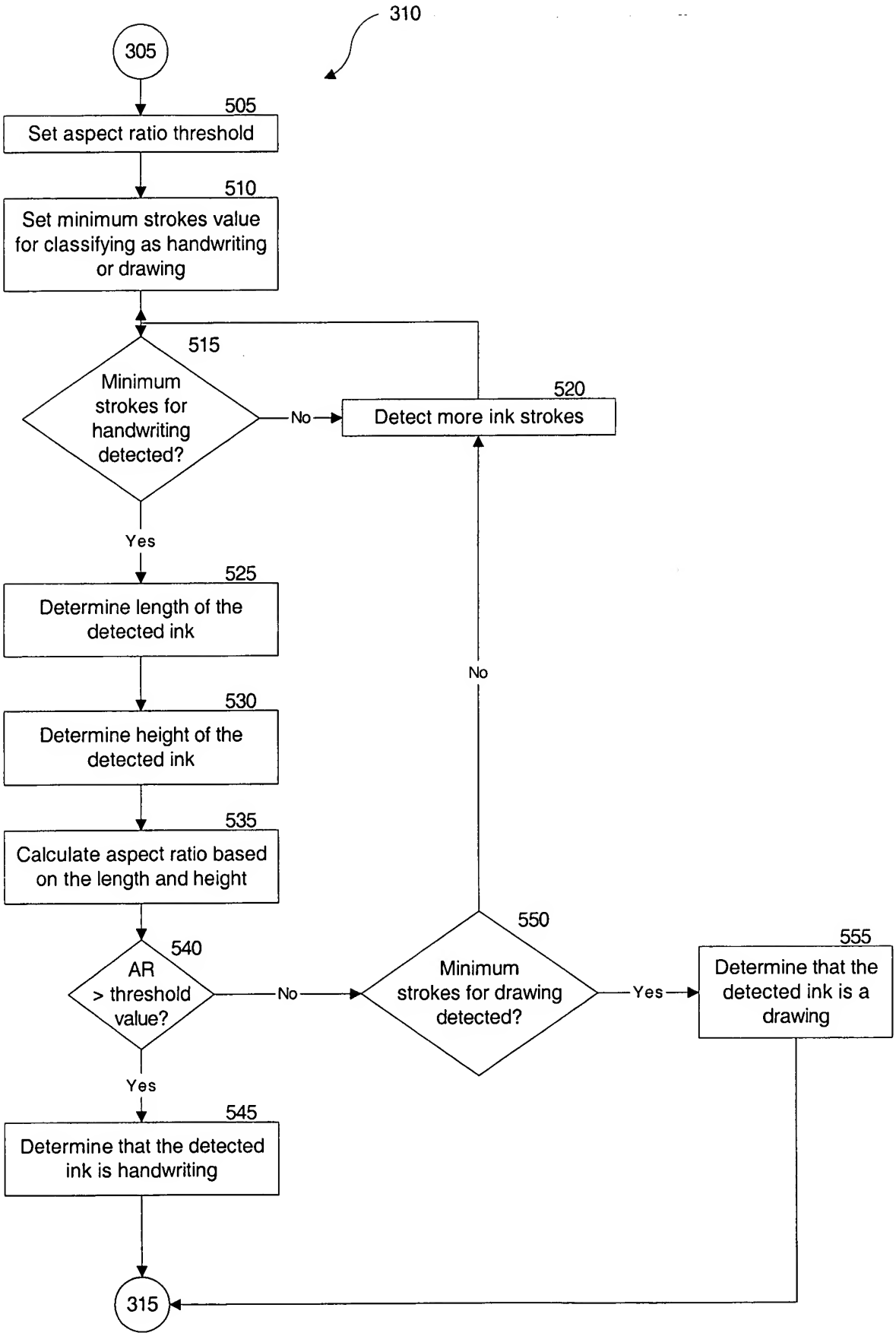
310
305
505
Set aspect ratio threshold
510
Set minimum strokes value for classifying as handwriting or drawing
515
Minimum strokes for handwriting detected?
No
520
Detect more ink strokes
Yes
525
Determine length of the detected ink
530
Determine height of the detected ink
535
Calculate aspect ratio based on the length and height
540
AR > threshold value?
No
550
Minimum strokes for drawing detected?
Yes
555
Determine that the detected ink is a drawing
No
Yes
545
Determine that the detected ink is handwriting
315

Figure 5

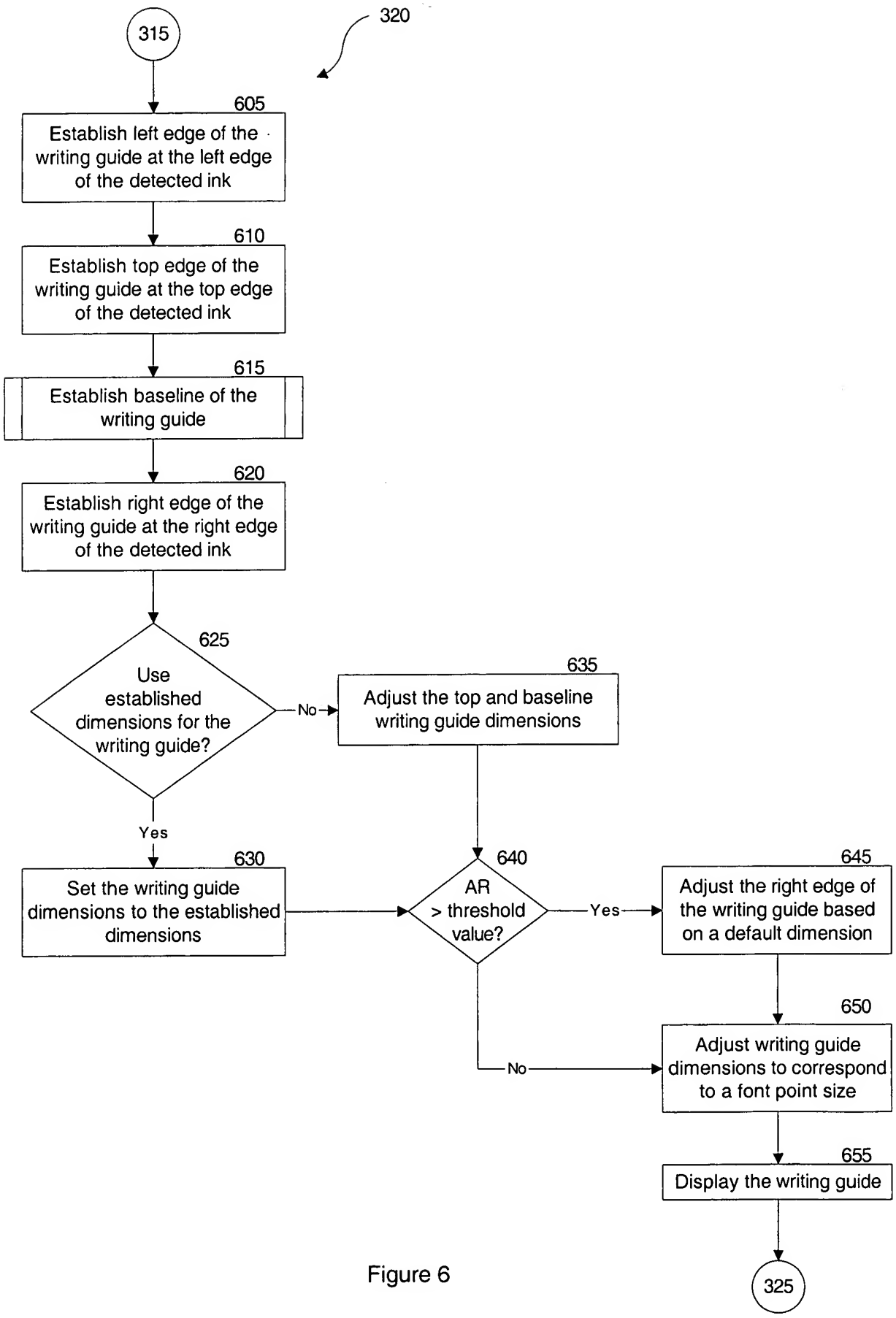
315
320
605
Establish left edge of the writing guide at the left edge of the detected ink
610
Establish top edge of the writing guide at the top edge of the detected ink
615
Establish baseline of the writing guide
620
Establish right edge of the writing guide at the right edge of the detected ink
625
Use established dimensions for the writing guide?
No
635
Adjust the top and baseline writing guide dimensions
Yes
630
Set the writing guide dimensions to the established dimensions
640
AR > threshold value?
Yes
645
Adjust the right edge of the writing guide based on a default dimension
No
650
Adjust writing guide dimensions to correspond to a font point size
655
Display the writing guide
325

Figure 6

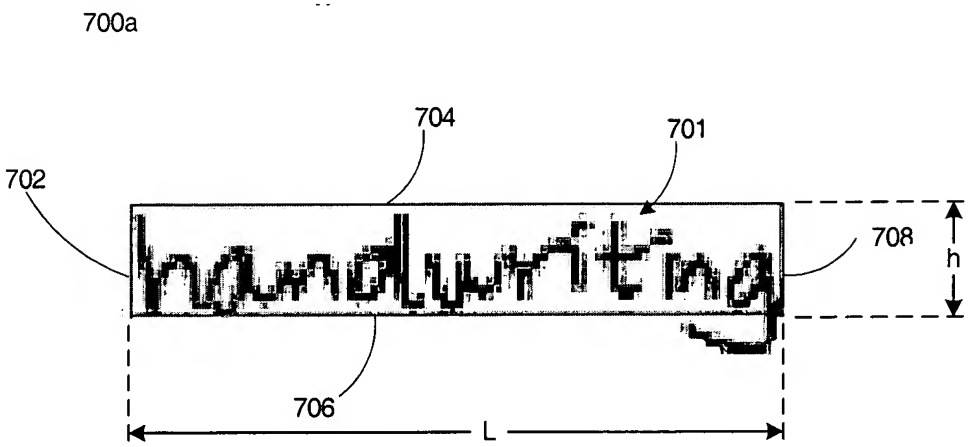

Figure 7A

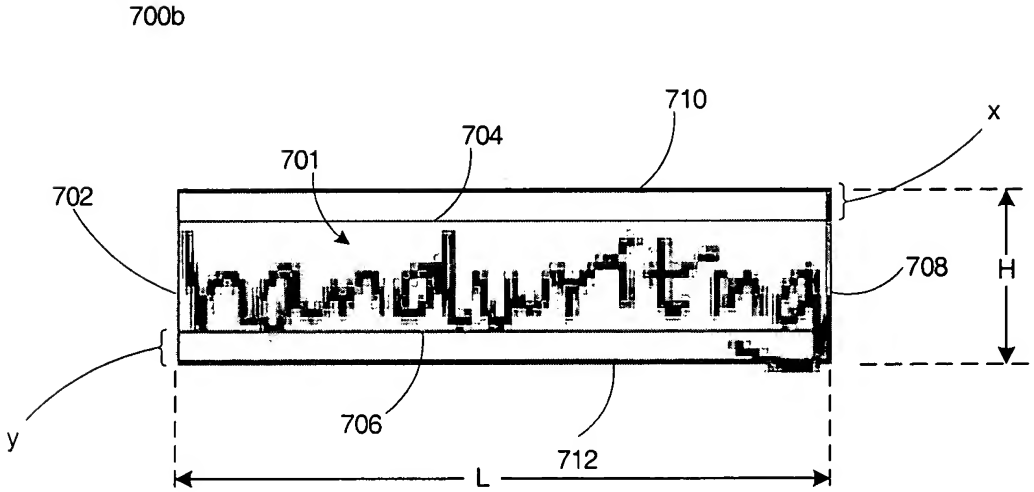

Figure 7B

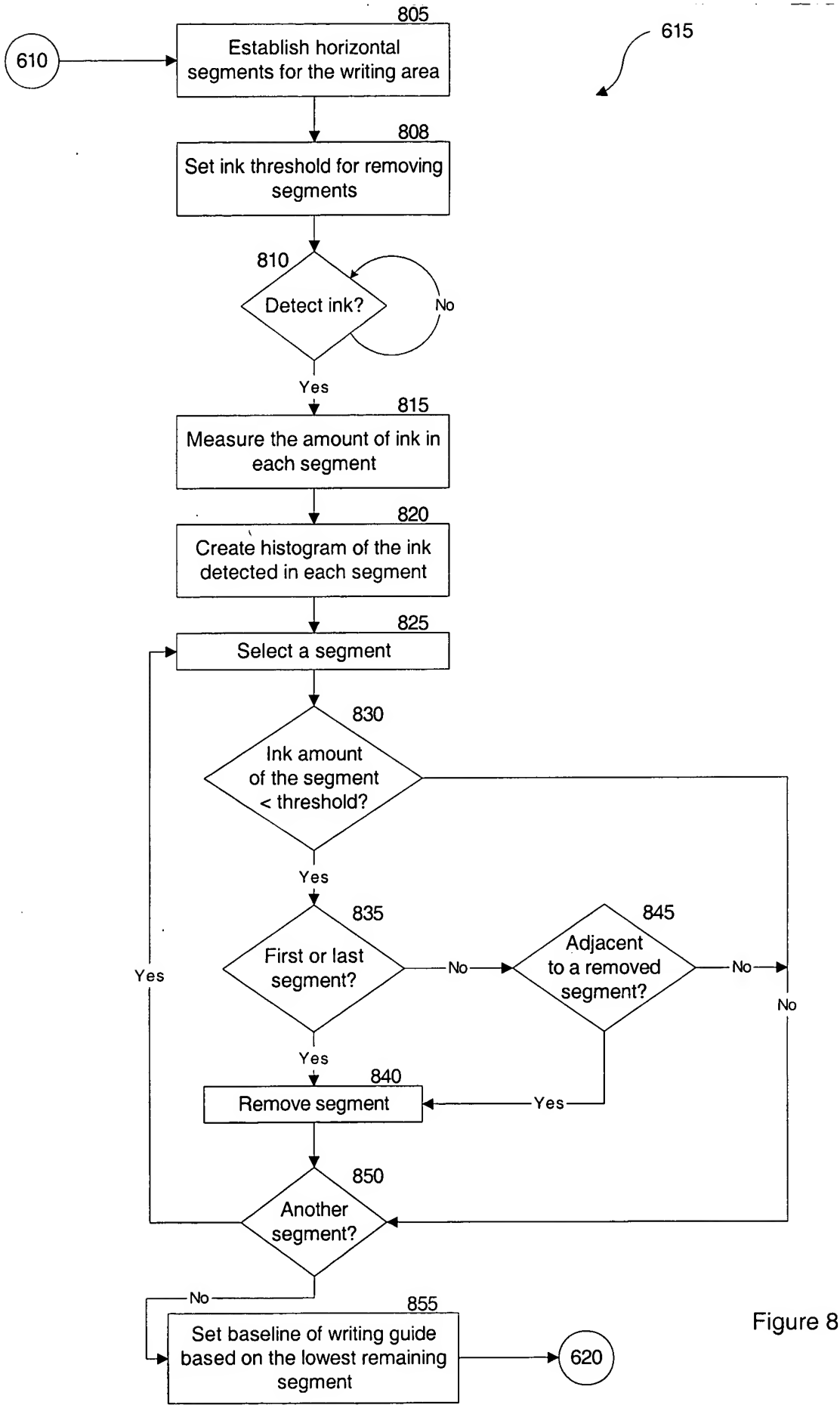
610
805
Establish horizontal segments for the writing area
615
808
Set ink threshold for removing segments
810
Detect ink?
No
Yes
815
Measure the amount of ink in each segment
820
Create histogram of the ink detected in each segment
825
Select a segment
830
Ink amount of the segment < threshold?
Yes
835
First or last segment?
No
845
Adjacent to a removed segment?
No
No
Yes
Yes
840
Remove segment
Yes
850
Another segment?
No
855
Set baseline of writing guide based on the lowest remaining segment
620

Figure 8

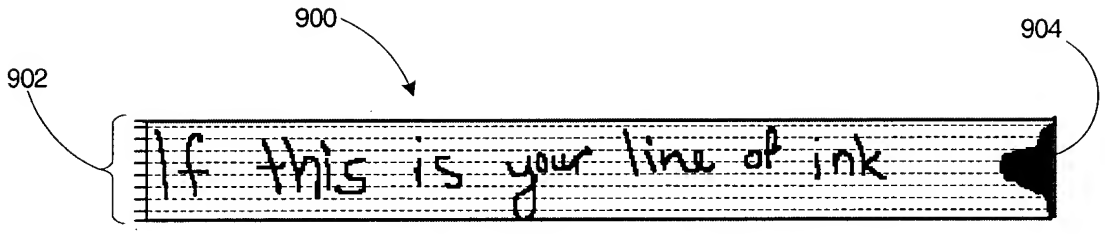

Figure 9

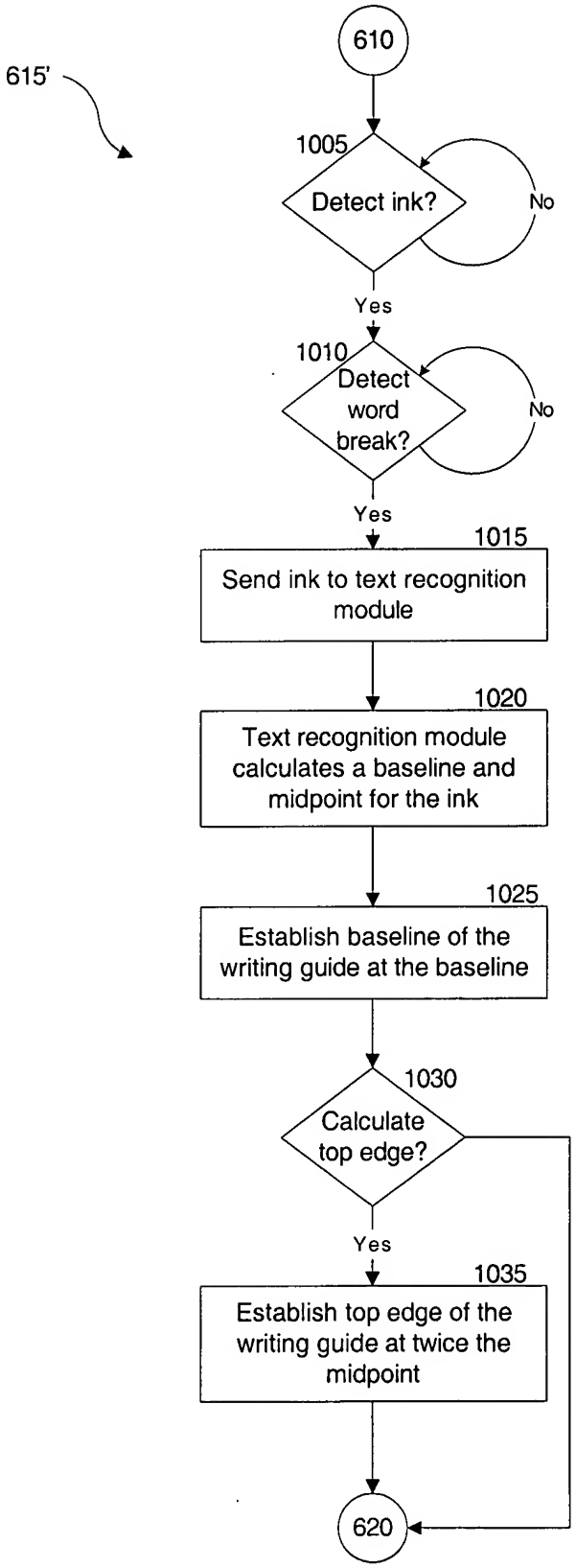
615'
610
1005
Detect ink?
No
Yes
1010
Detect word break?
No
Yes
1015
Send ink to text recognition module
1020
Text recognition module calculates a baseline and midpoint for the ink
1025
Establish baseline of the writing guide at the baseline
1030
Calculate top edge?
Yes
1035
Establish top edge of the writing guide at twice the midpoint
620

Figure 10

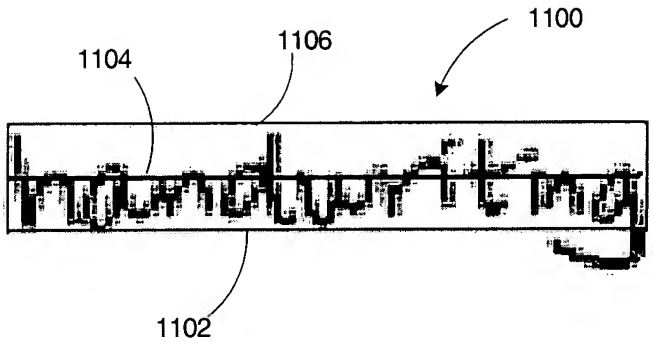

Figure 11

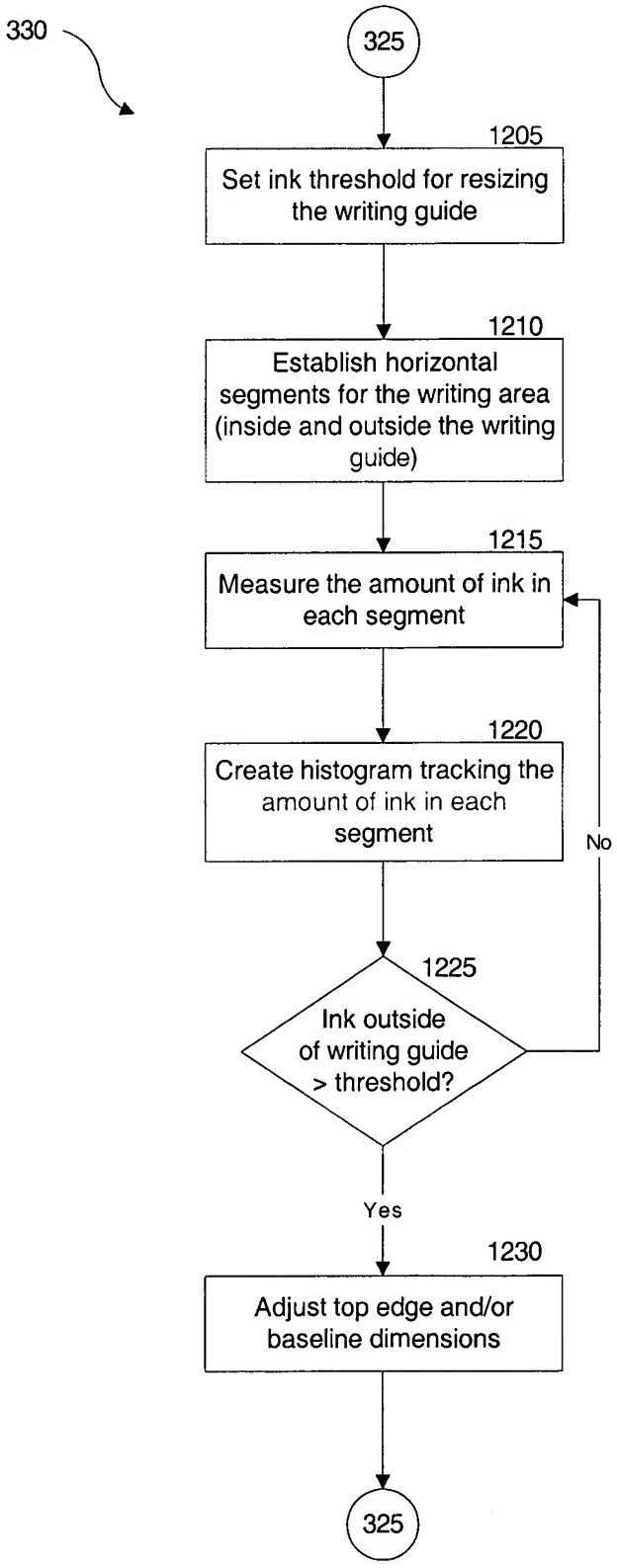
330
325
1205
Set ink threshold for resizing the writing guide
1210
Establish horizontal segments for the writing area (inside and outside the writing guide)
1215
Measure the amount of ink in each segment
1220
Create histogram tracking the amount of ink in each segment
1225
Ink outside of writing guide > threshold?
No
Yes
1230
Adjust top edge and/or baseline dimensions
325

Figure 12

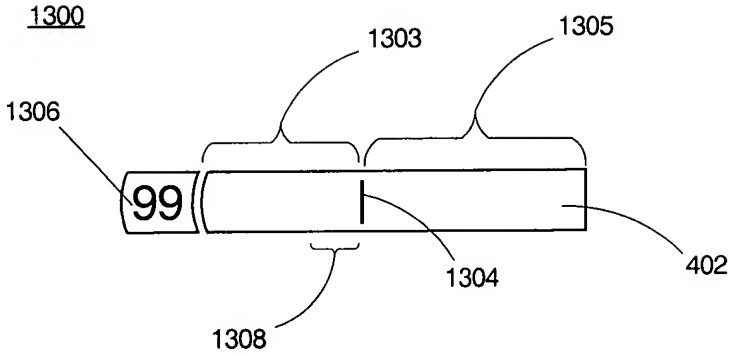

Figure 13

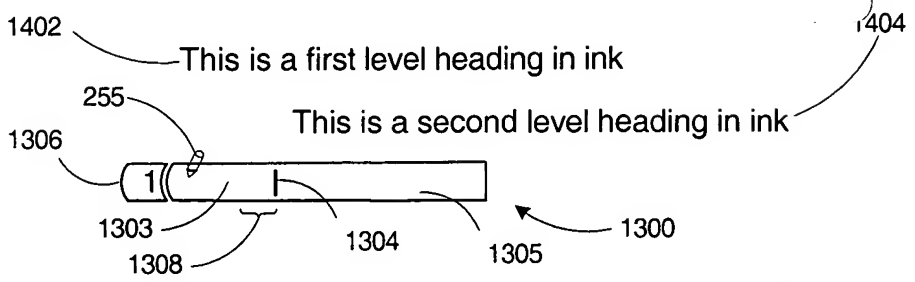

Figure 14A

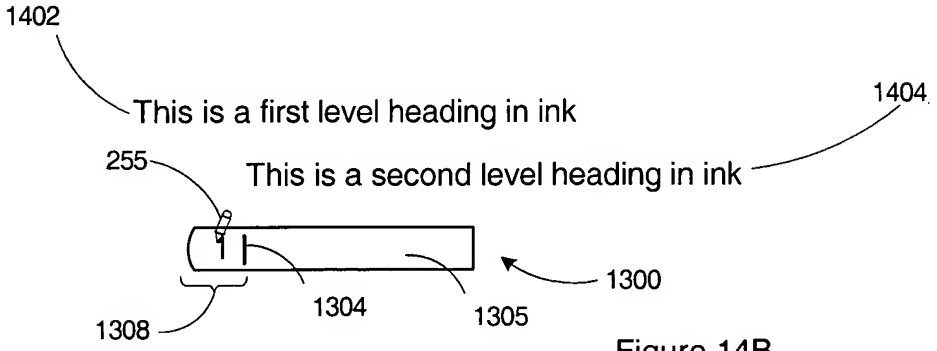

Figure 14B

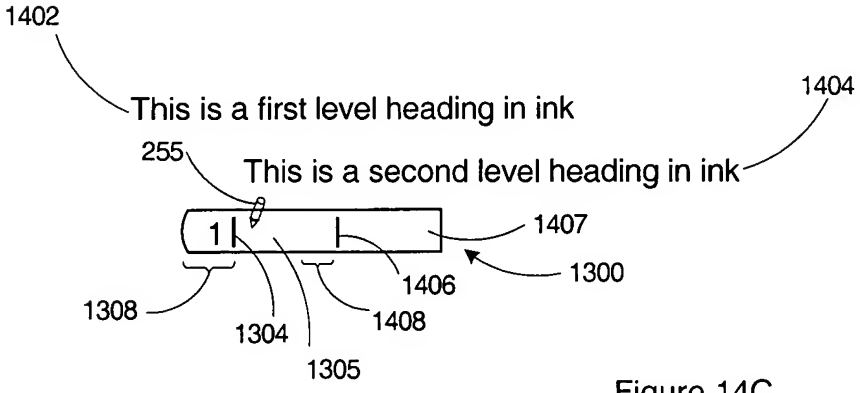

Figure 14C

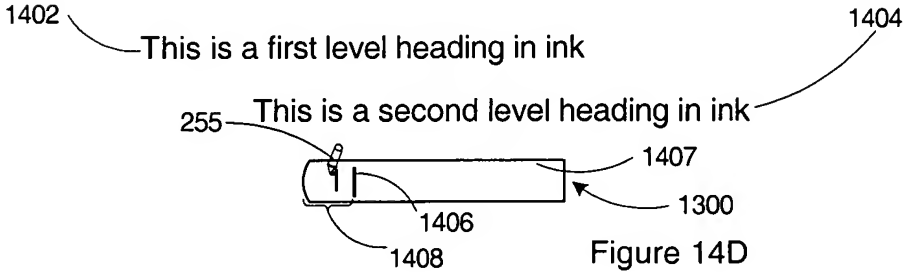

Figure 14D

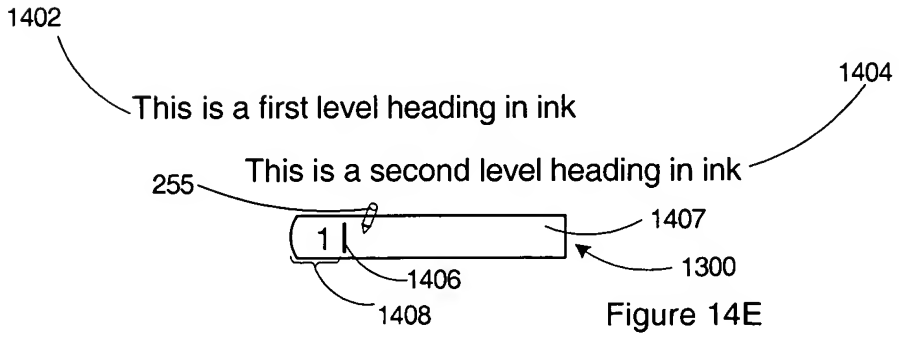

Figure 14E

1500

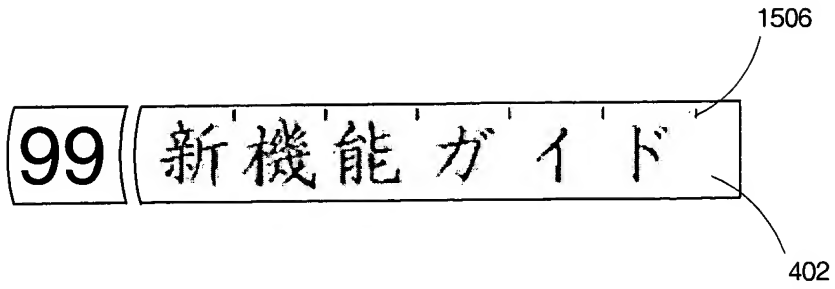

Figure 15

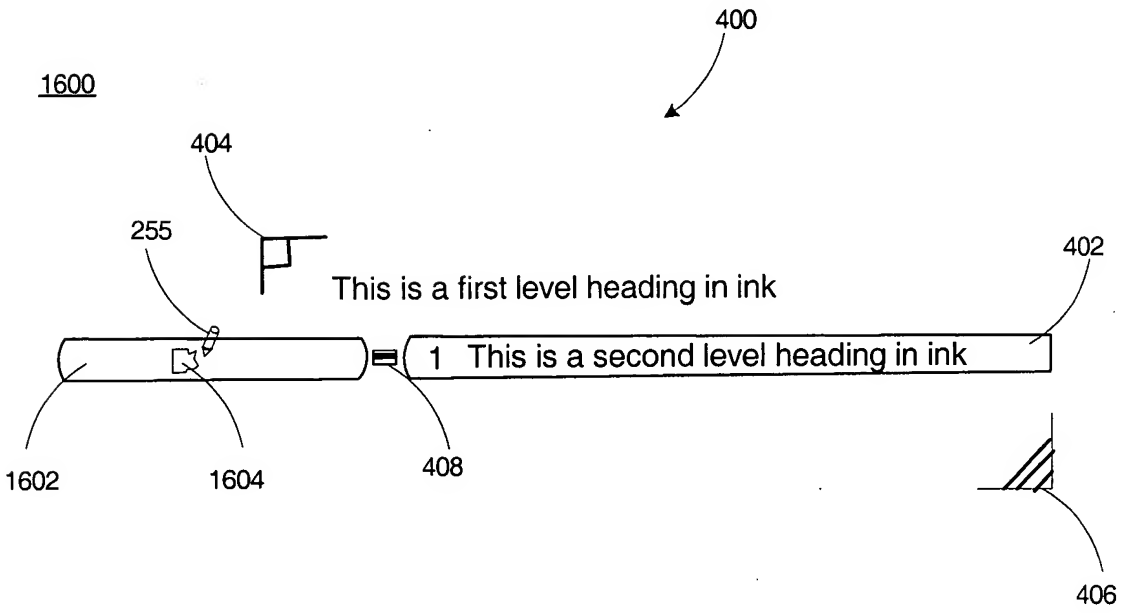

Figure 16

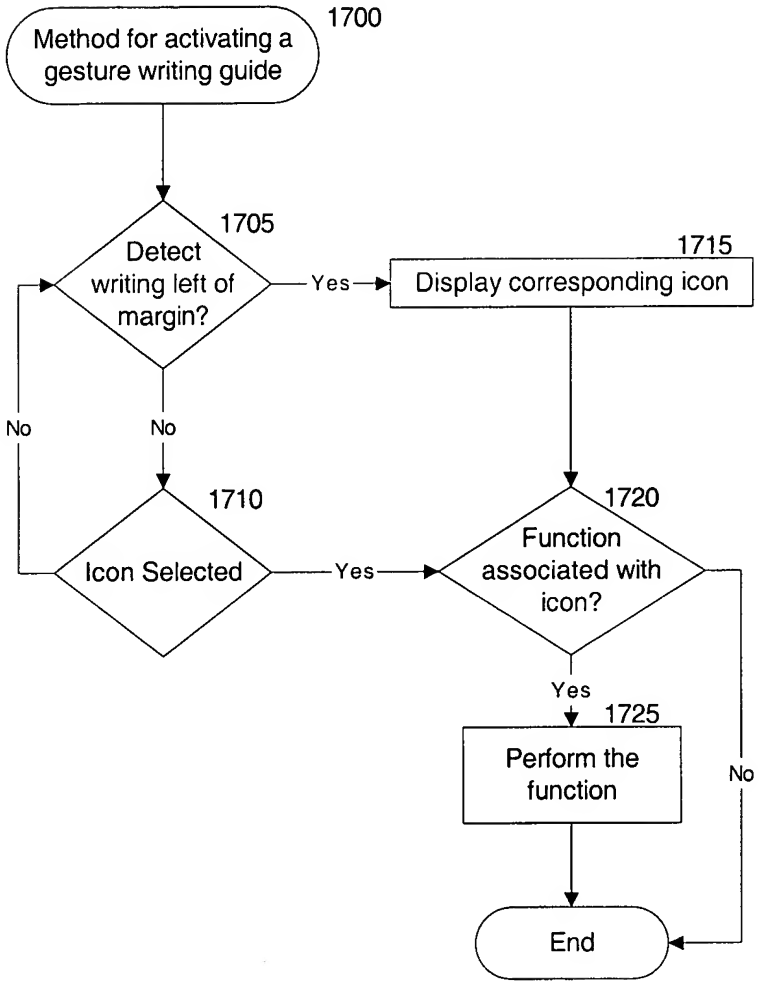
Method for activating a gesture writing guide
1700
Detect writing left of margin?
1705
Yes
Display corresponding icon
1715
No
No
Icon Selected
1710
Yes
Function associated with icon?
1720
Yes
Perform the function
1725
No
End

Figure 17

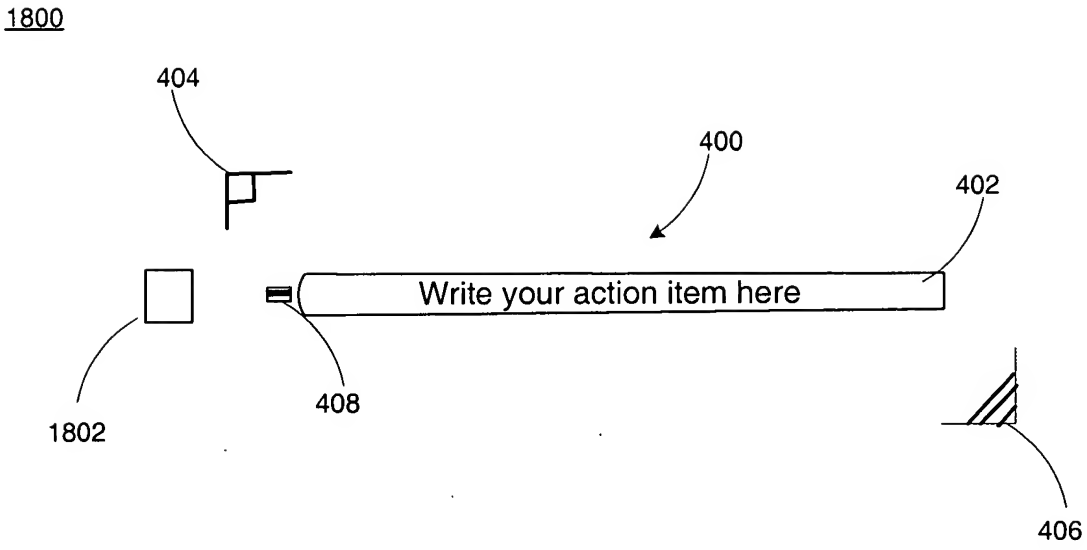

Figure 18

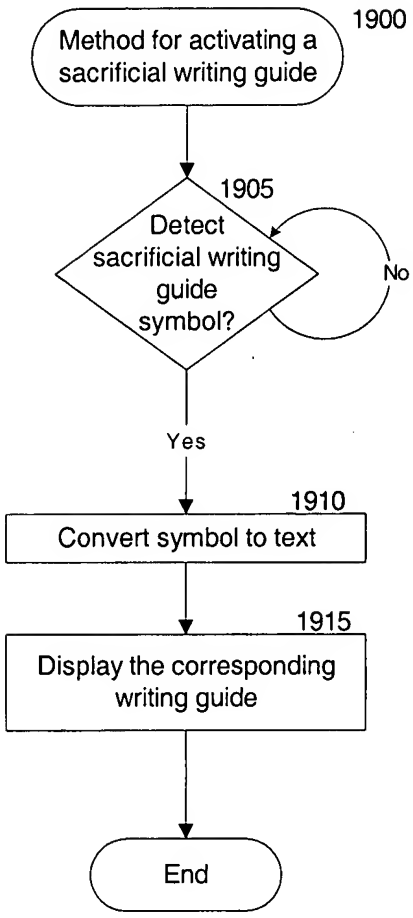
Method for activating a sacrificial writing guide
1900
1905
Detect sacrificial writing guide symbol?
No
Yes
1910
Convert symbol to text
1915
Display the corresponding writing guide
End

Figure 19

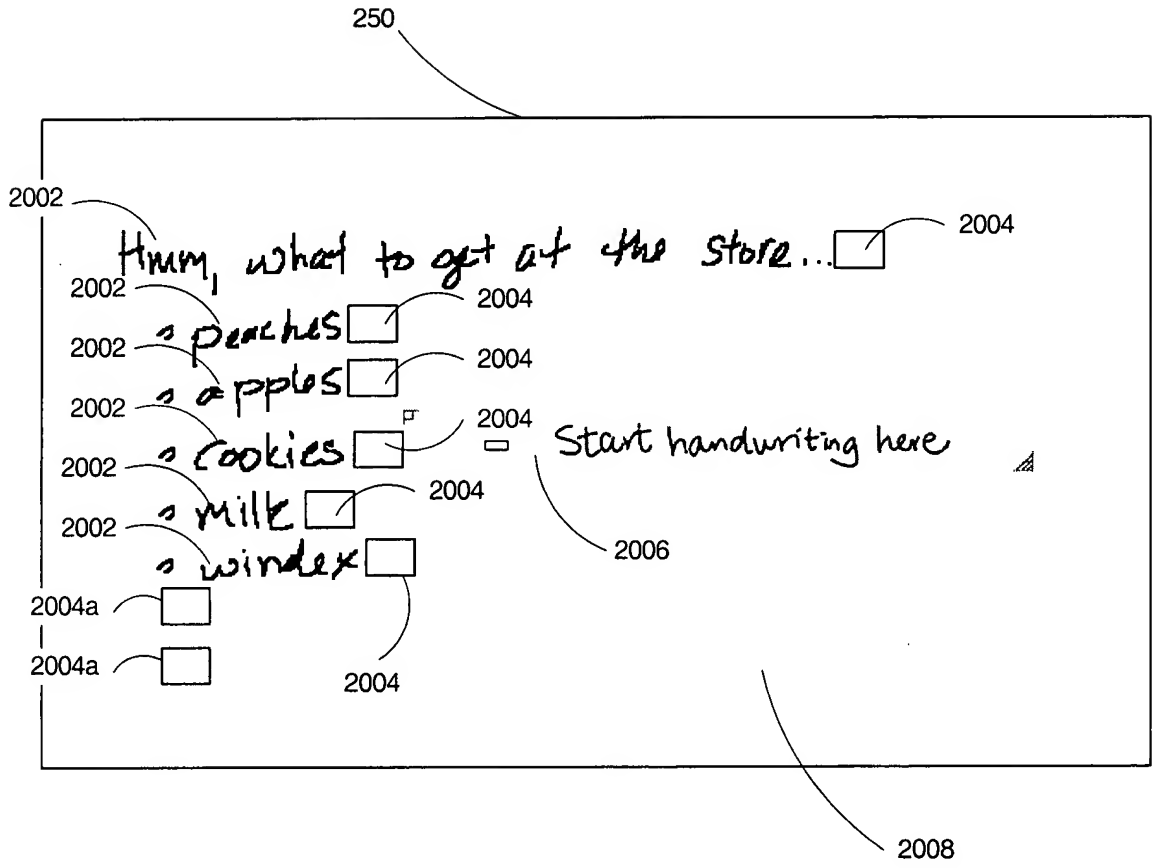
250
2002
Hmm, what to get at the store...
2004
2002
peaches
2004
2002
apples
2004
2002
cookies
2004
Start handwriting here
2002
milk
2004
2006
2002
windex
2004a
2004a
2004
2008

Figure 20

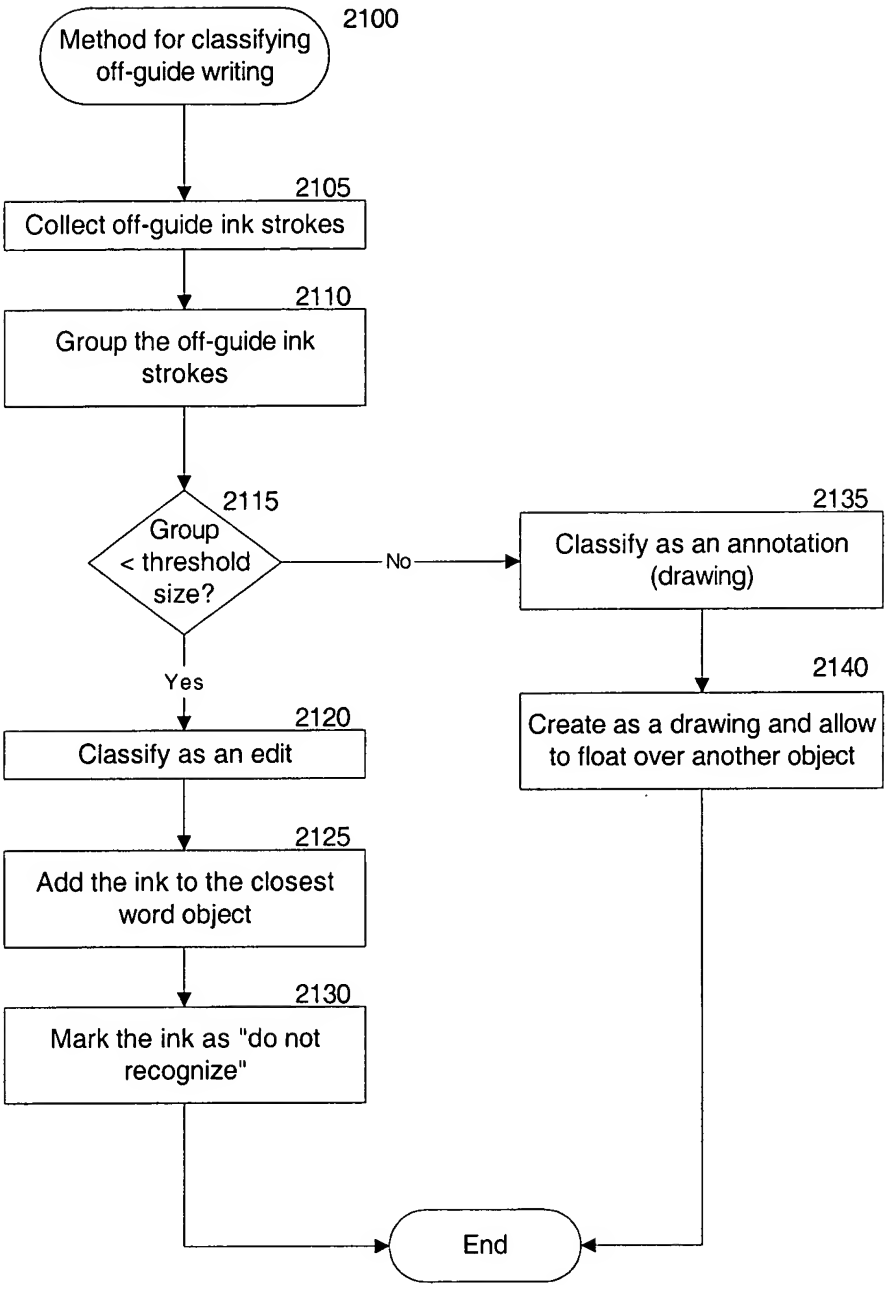
Method for classifying off-guide writing
2100
2105
Collect off-guide ink strokes
2110
Group the off-guide ink strokes
2115
Group < threshold size?
No
2135
Classify as an annotation (drawing)
2140
Create as a drawing and allow to float over another object
Yes
2120
Classify as an edit
2125
Add the ink to the closest word object
2130
Mark the ink as "do not recognize"
End

Figure 21

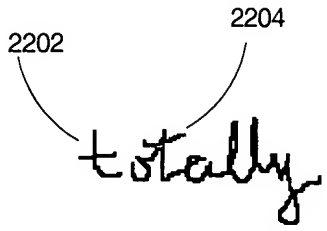

Figure 22A

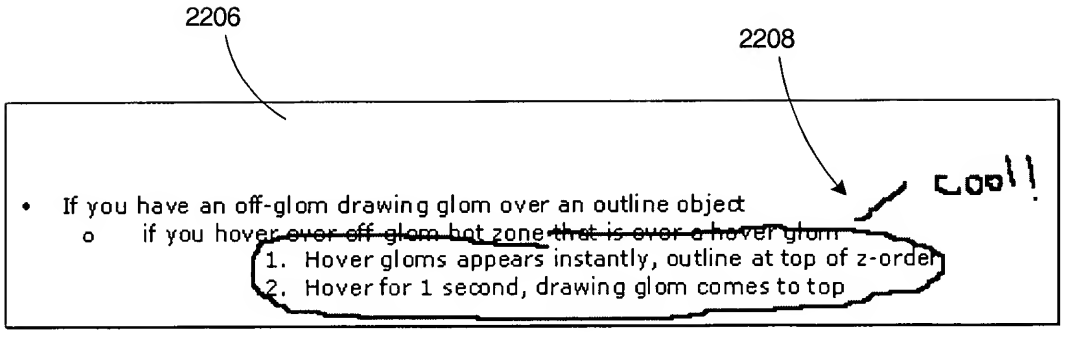

Figure 22B

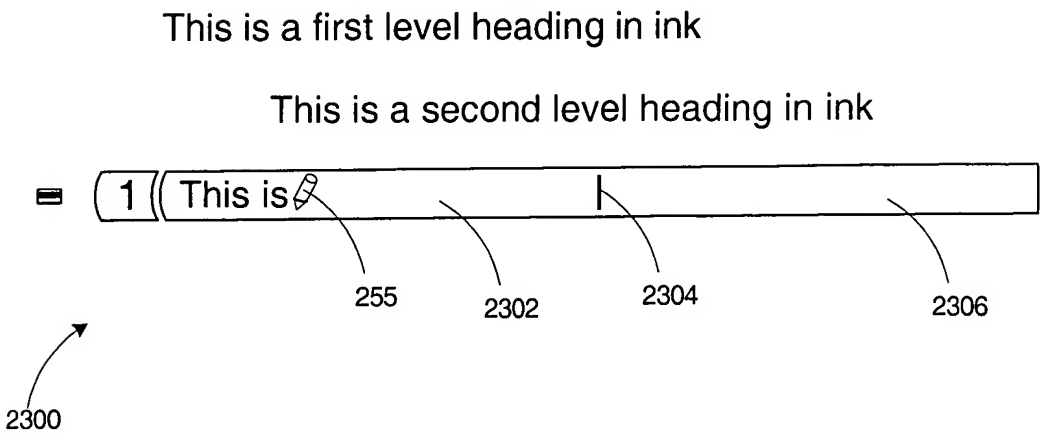

Figure 23A

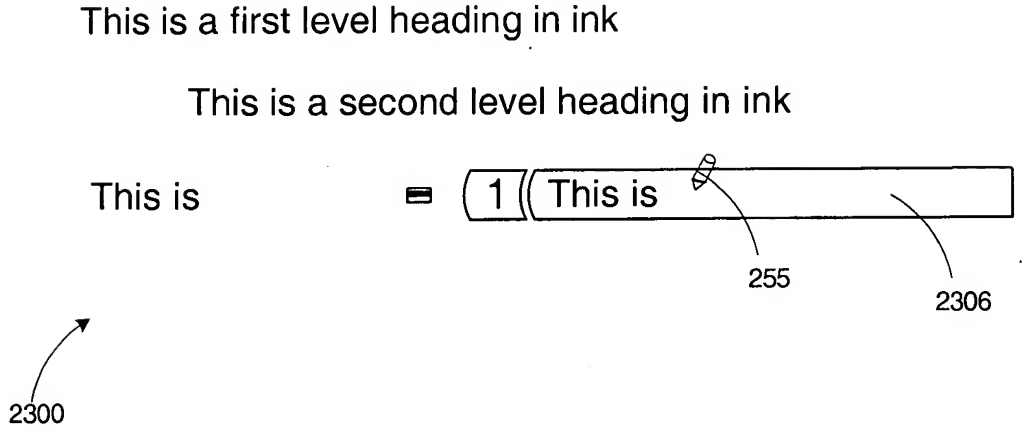

Figure 23B

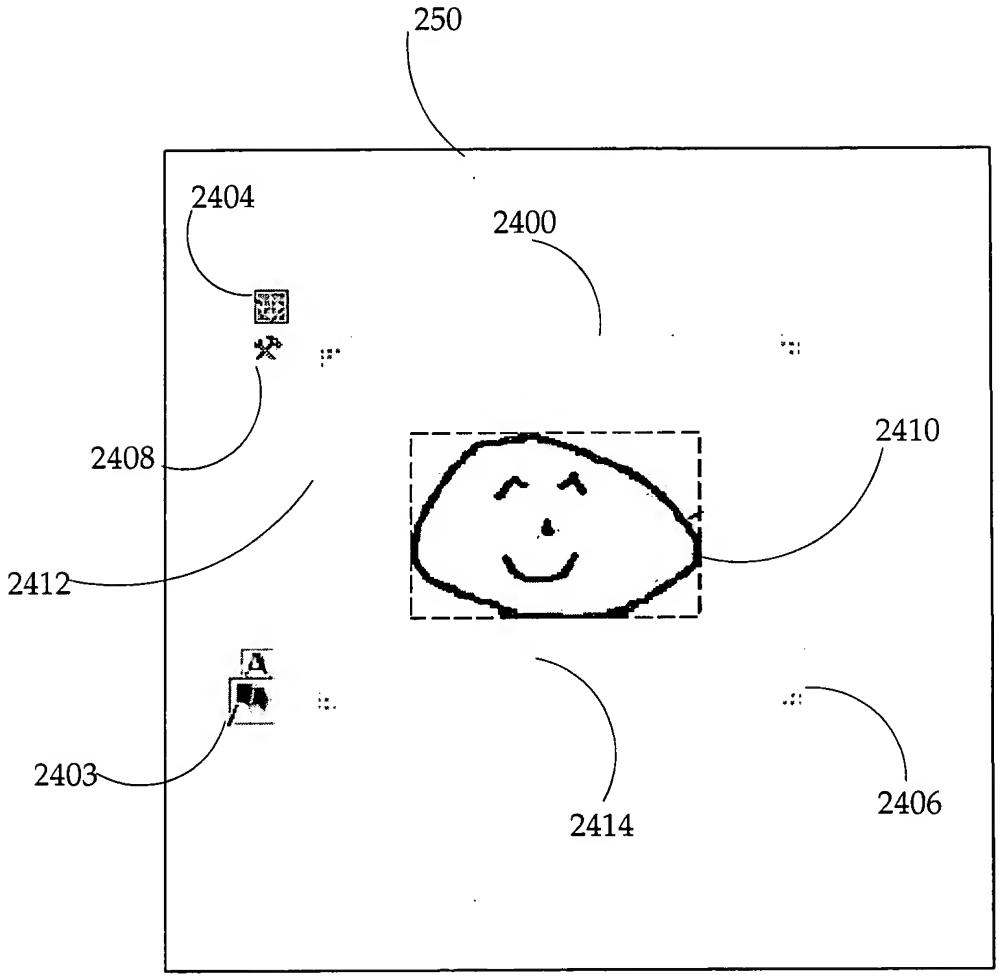

Figure 24

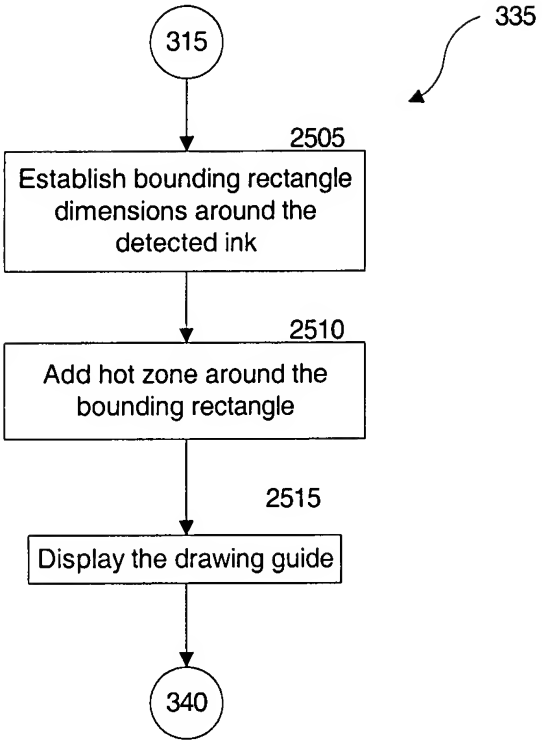
315
335
2505
Establish bounding rectangle dimensions around the detected ink
2510
Add hot zone around the bounding rectangle
2515
Display the drawing guide
340

Figure 25

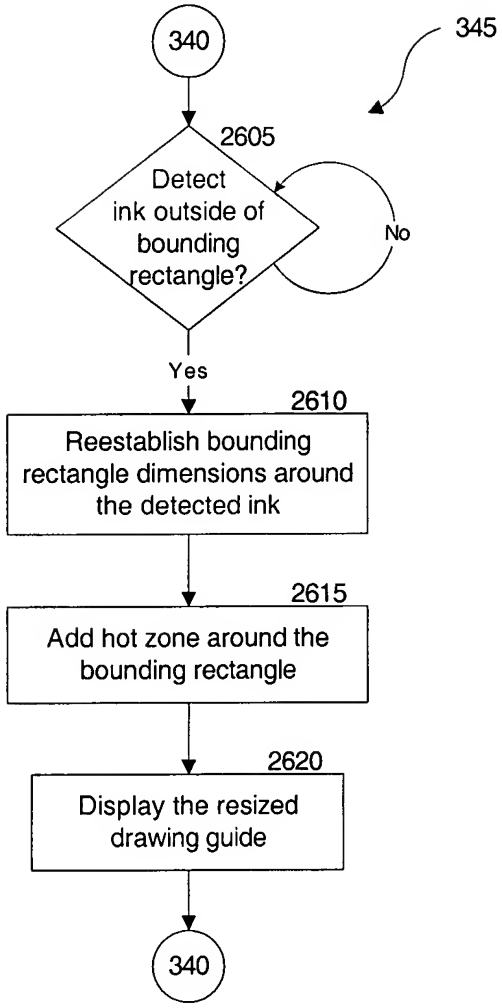
340
345
2605
Detect ink outside of bounding rectangle?
No
Yes
2610
Reestablish bounding rectangle dimensions around the detected ink
2615
Add hot zone around the bounding rectangle
2620
Display the resized drawing guide
340

Figure 26

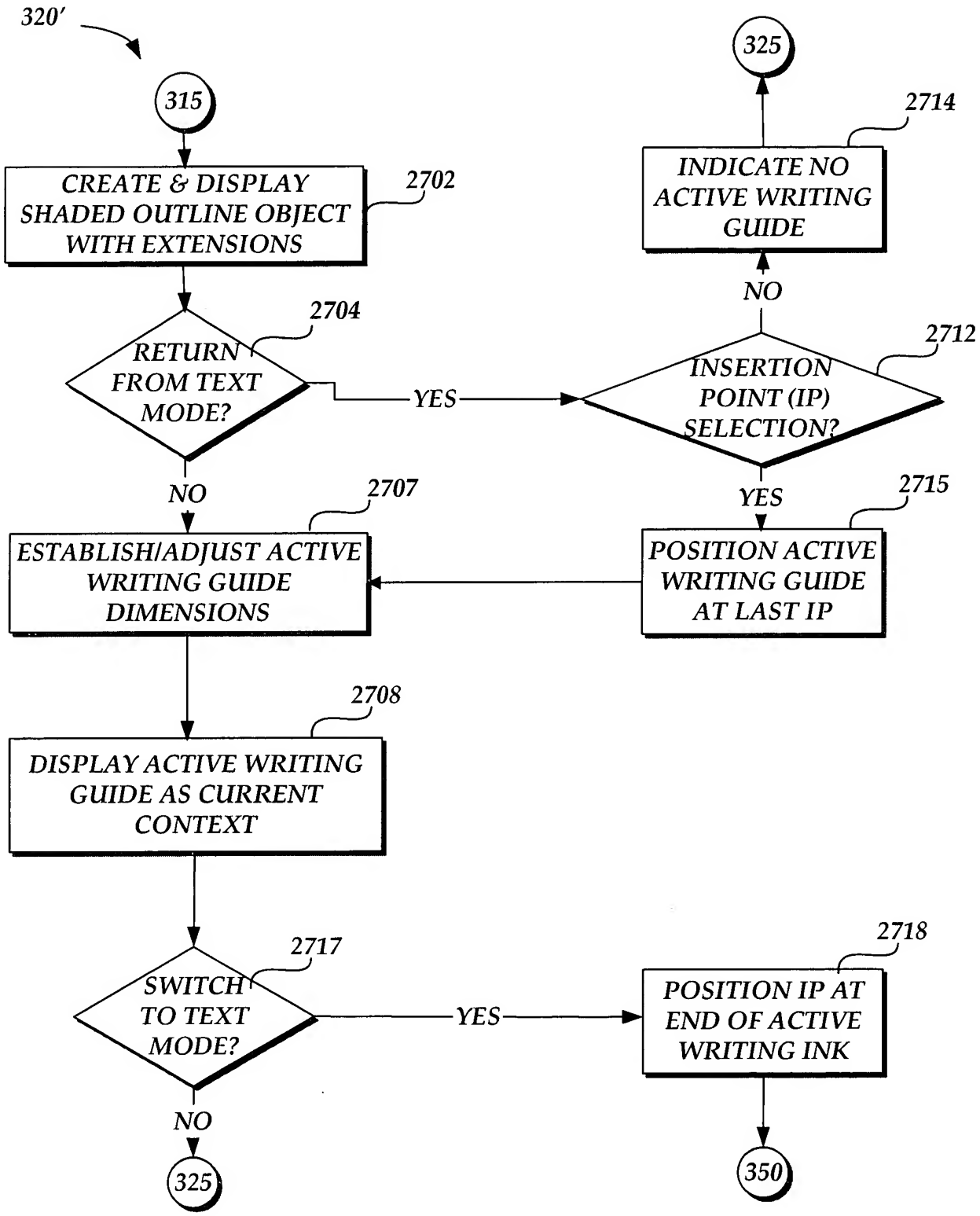
320'
315
CREATE & DISPLAY SHADED OUTLINE OBJECT WITH EXTENSIONS
2702
RETURN FROM TEXT MODE?
2704
YES
NO
INSERTION POINT (IP) SELECTION?
2712
NO
YES
INDICATE NO ACTIVE WRITING GUIDE
2714
325
ESTABLISH/ADJUST ACTIVE WRITING GUIDE DIMENSIONS
2707
POSITION ACTIVE WRITING GUIDE AT LAST IP
2715
DISPLAY ACTIVE WRITING GUIDE AS CURRENT CONTEXT
2708
SWITCH TO TEXT MODE?
2717
YES
NO
POSITION IP AT END OF ACTIVE WRITING INK
2718
325
350

Fig. 27

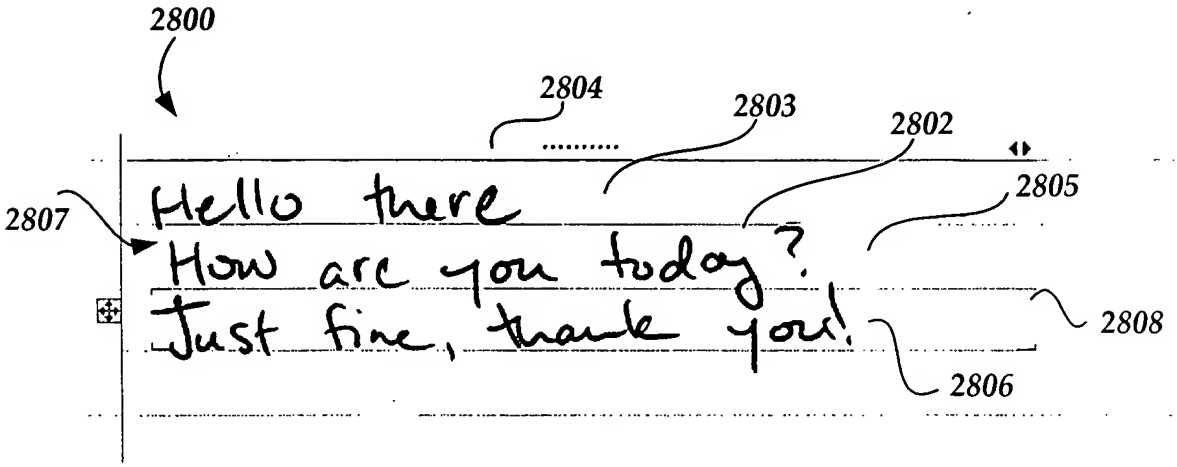

Fig. 28

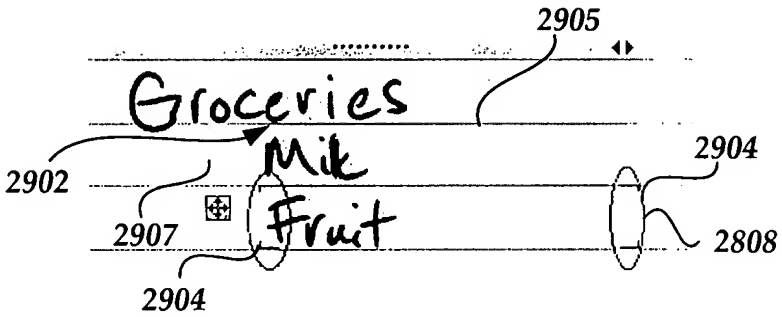

Fig. 29

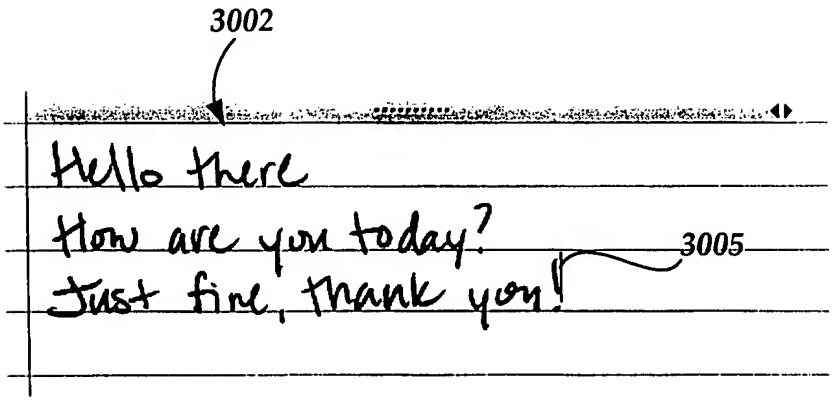

Fig. 30

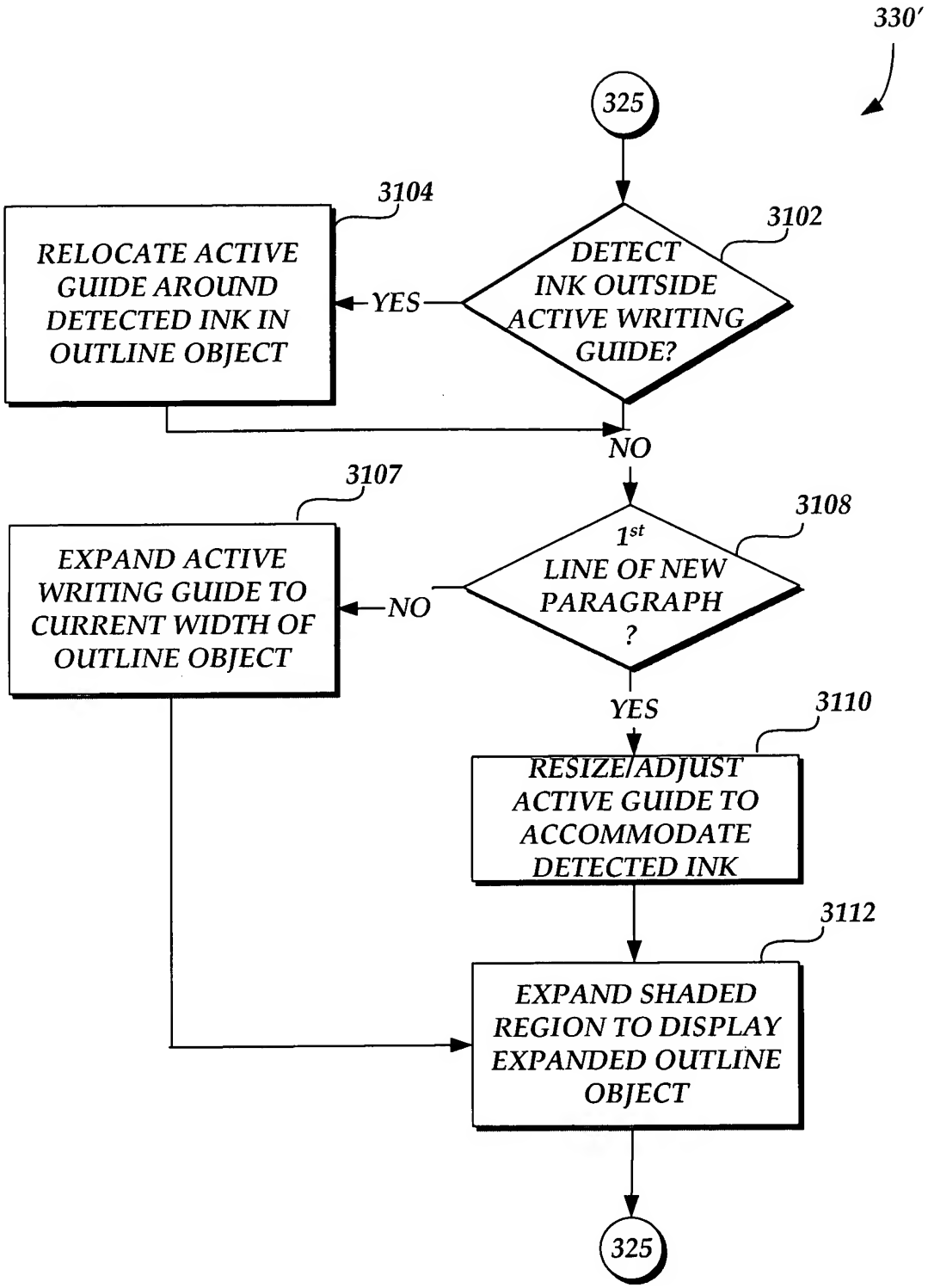
330'
325
3104
RELOCATE ACTIVE GUIDE AROUND DETECTED INK IN OUTLINE OBJECT
YES
3102
DETECT INK OUTSIDE ACTIVE WRITING GUIDE?
NO
3107
EXPAND ACTIVE WRITING GUIDE TO CURRENT WIDTH OF OUTLINE OBJECT
NO
3108
1st LINE OF NEW PARAGRAPH ?
YES
3110
RESIZE/ADJUST ACTIVE GUIDE TO ACCOMMODATE DETECTED INK
3112
EXPAND SHADED REGION TO DISPLAY EXPANDED OUTLINE OBJECT
325

Fig. 31

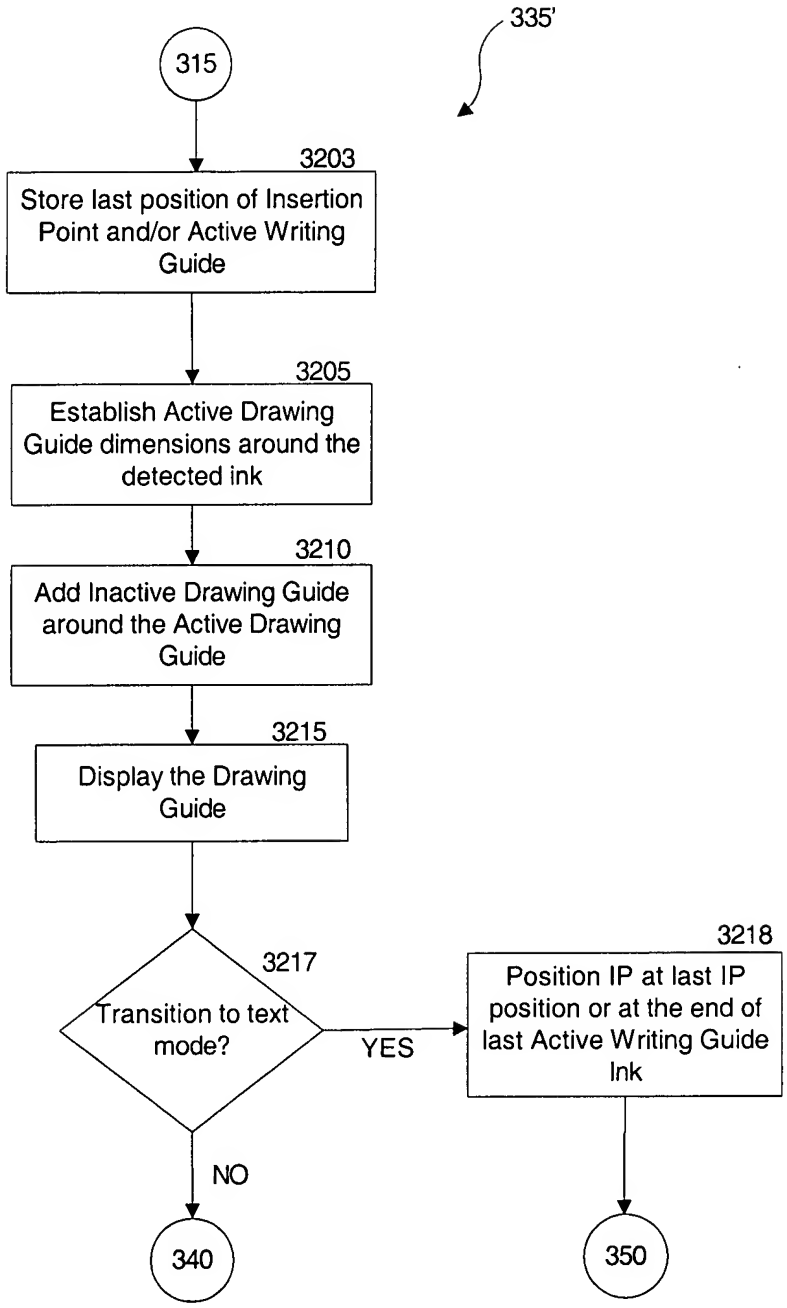
335'
315
3203
Store last position of Insertion Point and/or Active Writing Guide
3205
Establish Active Drawing Guide dimensions around the detected ink
3210
Add Inactive Drawing Guide around the Active Drawing Guide
3215
Display the Drawing Guide
3217
Transition to text mode?
YES
3218
Position IP at last IP position or at the end of last Active Writing Guide Ink
NO
340
350

Figure 32